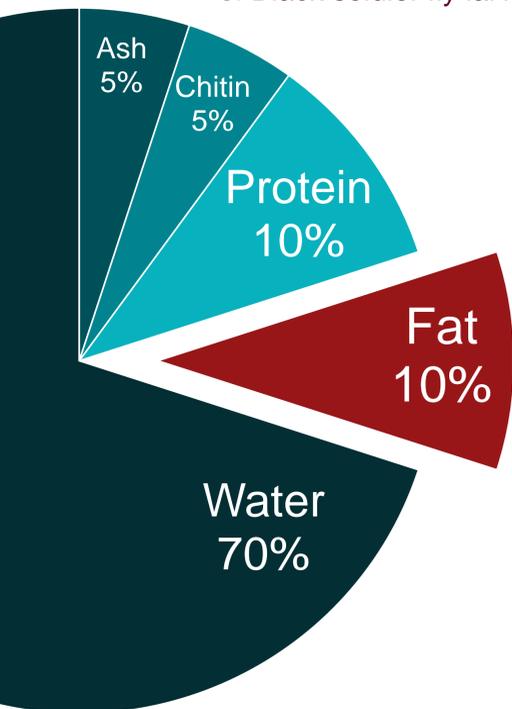


- The world population is increasing and as more people get a higher income the demand for meat is increasing
- One third of all food produced worldwide goes to waste

Master's thesis in food science:

The FAT larva a future feed for animals?

1. Average nutritional composition of Black soldier fly larvae



CONCLUSIONS

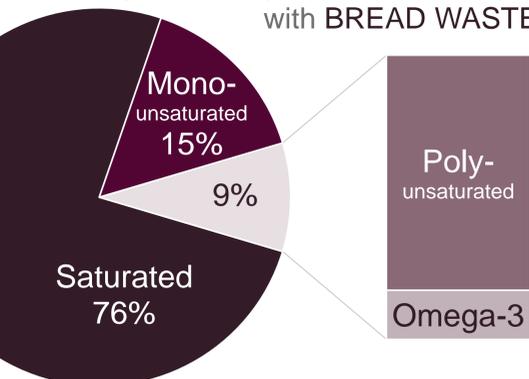
- What the black soldier fly larvae eat affects the nutritional composition of the larvae and therefore also the quality as an animal feed.
- The larvae contains mainly saturated fatty acids*. Whether this is beneficial in animal feed remains to be investigated.
- If the larvae eat something with omega-3 fatty acids, the larval fat will also contain omega-3 fatty acids. These fatty acids are essential in for example fish feed.

FOOD WASTE

BLACK SOLDIER FLY LARVAE

- The larvae can eat a variety of different materials such as food waste, food industry by-products, manure and sewer sludge.
- The nutritional composition of the larvae makes it suitable as a feed for animals.

2. Fatty acid composition of larvae fed with BREAD WASTE



METHOD: Black soldier fly larvae were fed for two weeks with six different feeds: bread waste, food waste, rainbow trout and ensiled, rotten and fresh mussels. The protein, fat and ash content were analysed in both the feed and the larvae.

RESULTS

1. The larvae contained on average 70% water, 10% fat, 10% protein, 5% ash (metals and minerals), 5% chitin (part of insect exoskeleton). Depending on the feed, differences were seen especially in the fat and ash content.
2. The main part of the larval fat was saturated fatty acids. The highest percentage was found in the larvae fed with **bread waste**. A positive correlation was found between larval weight and saturated fatty acids, indicating that the larvae produce more saturated fatty acids when they grow.
3. The more omega-3 fatty acids in the feed, the more was found in the larvae. The highest percentage was found in the larvae fed with **ensiled mussels**. But, these larvae grew poorly. Therefore it is also important to consider how well the larvae grows when evaluating the feed.

ANIMAL FEED

- Within the European Union the black soldier fly larvae is allowed as feed in aquaculture.
- Omega-3 fatty acids are essential for fish and therefore the larvae's fat is important.

Black Soldier Fly (*Hermetia illucens*)

- The species is found in tropical areas all over the world
- It has four stages: egg, larva, pupa and adult fly. The full life cycle can take as short as six weeks in optimal conditions.



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Photos: Nils Ewald, Aleksandar Vidakovic

SCIENCE AND EDUCATION **FOR SUSTAINABLE LIFE**

*Saturated fatty acids = Mättade fettsyror
Mono-unsaturated fatty acids = Enkelomättade fettsyror
Poly-unsaturated fatty acids = Fleromättade fettsyror